Space Weather Forecast

Issued on Saturday, 09 March 2024 at 13:03 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Reducing slight chance of G1/Minor Geomagnetic Storm during 09 March. Daily chance of Moderate-class X-ray flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate, with a peak Moderate-class flare at 08/2126 UTC from the magnetically complex region near centre disk. There remains six numbered sunspot regions on the visible disc. The largest and most complex aforementioned region retaining at least one Mt Wilson delta spot, the most evident one in its leading portion. All other spots are small, stable or showing a gradual decaying trend.

No Earth directed coronal mass ejections have been observed in coronagraph imagery. A filament lift-off (arc of plasma) which occurred at 08/0130UTC in the SW quadrant is undergoing analysis for any potential Earth-directed component.

Solar Wind / Geomagnetic Activity: Solar wind parameters suggested a fast solar wind environment from a coronal hole. The solar wind speed started the period at Elevated levels, gradually reducing to the current Slightly Elevated levels, with a declining trend. The Interplanetary Magnetic Field was weak throughout, while the north-south component also varied weakly. The net result of the above solar wind measures was mostly Quiet at first (Kp 0-1), with Active (Kp 4) intervals observed between 08/2100-09/0300 UTC, with an Unsettled (Kp 3) interval observed at 09/0300-0600UTC, before returning to current Quiet (Kp1-2) conditions.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Expected to remain generally low with a Chance of an isolated Moderate-class flare, mainly from the complex central sunspot. No significant regions leave or arrive in the period, meaning the trend is flat.

Solar Wind / Geomagnetic Activity: Up to, possibly, two coronal mass ejections (CMEs) may affect Earth in the forecast period. Recent solar wind parameters indicate the continued connection to a coronal hole. Solar winds may be further enhanced by the arrival of a CME on Day 1 (09 March). This may bring the slight chance of a glancing blow from a filament eruption (arc of plasma) which left the Sun on 05 March, although this currently thought to be overdue. Another glancing CME is possible on Day 3 (11 March) from an eruption which left the Sun on 07 March, though this is low confidence. Unsettled activity in the fast wind may give way to a Slight Chance of G1/Minor Storm in the next 12 hours due to the glancing CME from 05 March, although this is now considered to be low confidence and overdue. Geomagnetic activity should then become Quiet from day 2 (10 March) as the fast wind similarly eases, perhaps with a Slight Chance of G1/Minor Storm intervals Day 3 (11 March) should the 07 March CME affect Earth.

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Energetic Particles / Solar Radiation: No solar radiation storms are expected.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	5	20	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	30	30	30	30
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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